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EXAMINER	
COLEMAN, KEITH A	
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3747	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/743,811	HOFF ET AL.	
	Examiner	Art Unit	
	KEITH COLEMAN	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 7, 8, 9,11, 13, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) in view of Ito et al. (US Patent Publication 2002/0029755) and Worth (US Patent No. 1,974,907).

With regards to claim 1, the patent to Banzhaf et al. discloses an engine (1, Col. 3, Line 59) having a first coolant circuit (11 and 12, Col. 3, Lines 62-65, See Figure 6), a torque converter (2, Col. 3, Lines 58-61, See Figure 6) operatively connected to the engine (1) and in communication with the first coolant circuit (11 and 12, via immediate heat exchanger 90 through lines 53, 41,39 and 37, See Figure 6) and at least one auxiliary power unit (pump 52 driven motor 41, Col. 7, Lines 18-30, See Figure 6) having a second coolant circuit (41, Col. 7, Lines 21-25), wherein the first coolant circuit (11 and 12) is in fluid communication with the second coolant circuit (41, See Figure 6, via Line 53 when valve 54 is open, Col. 7, Lines 55-60). Banzhaf et al. does not positively disclose whether the torque converter (2) and circuits 41, 39, and 37 are in 'fluid' communication. However, Banzhaf et al. does disclose placing immediate heat exchangers on any part of the coolant circuit and functioning to cool and heat transmission oil (Col. 2, Lines 29-40). Furthermore, the publication to Ito et al. discloses an automatic transmission fluid warmer or ATF warmer (21, Paragraph 50, i.e. heat exchanger) integrated in an automatic transmission (22, Paragraph 50) using a fluid passage (22a) from engine (1, Paragraph 50). It would have been obvious to a person of ordinary Skill in the art at the time the invention was made to modify the coolant circuit system of Banzhaf et al. with the transmission in view of the teaching to Ito et al.,

in order to warm up the transmission (Paragraph 50 from Ito et al.). Therefore, establish fluid communication between the torque converter (2) and the first coolant circuit (11 and 12).

As to the new limitation of "at least one **auxiliary power unit configured to produce power** and having a second coolant circuit," the patent to Worth discloses a second engine (See Figure 1).

Since Worth explicitly states on Col. 1, Lines 20-29 that "to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting" and on Col. 1, Lines 99-105 that "Thus, if we assume that engine 7 is running, the hot water going from the head of this engine will be conducted partly downward through the radiator 5 and partly through the pipe 21 to the top of radiator 4", and Banzhaf et al. states on Col. 3, Lines 5-17 that "Moreover, **additional heating devices [i.e. heat from another engine] for auxiliary units, ...**, can be connected to the coolant circuit. It is likewise possible to provide coolant lines that can be shut off for the purpose of cooling auxiliary units, for example water-cooled generators. In order to control the air flow rate through the heat exchangers charged with cooling air, it is expedient to assign at least one speed-controlled fan to these heat exchangers. The drive of this fan can be performed, for example, by means of an electric motor, a liquid friction clutch or a hydrostatic drive," it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of the combination of Banzhaf et al. and Itoh et al. with at least one **auxiliary power unit configured to produce power** and having a second coolant circuit in view of the teaching to Worth, in

order to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting (Col. 1, Lines 20-29 from Worth)

With regards to claim 2, Banzhaf et al. discloses including a starter/generator (Col. 3, Lines 5-11) operatively connected to the engine and in fluid communication with a coolant circuit but does not positively disclose the starter/generator connected to a first coolant circuit. Since Banzhaf et al. explicitly discloses auxiliary units being water-cooled generators (Col. 3, Lines 5-11), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the first coolant circuit of the Banzhaf et al. with a starter/generator, in order to provide coolant to multiple auxiliary units (Col. 3, Lines 5-11).

With regards to claim 7, the patent to Banzhaf et al. discloses a thermostat (valve 54 are actuated by controller 10 based on the temperatures of sensors 94, 95, 97, and 96, Col. 7, Lines 55-67) in fluid communication with the second coolant circuit (41) and wherein the thermostat (valve 54 are actuated by controller 10 based on the temperatures of sensors 94,95, 97, and 96) is configured to allow a flow of coolant from the second coolant circuit (41) to the first coolant circuit (11 and 12) when a temperature of the second coolant circuit (41) is above a predetermined value (Col. 7, Lines 55-67). Using broadest reasonable interpretation, a thermostat is defined as a device (10) that automatically responds to temperature changes (via sensors 94,95, 97, and 96) and activates switches (15) controlling the equipment.

With regards to claim 8, the patent to Banzhaf et al. discloses a heat exchanger (3, Col. 3, Line 62, See Figure 6) in fluid communication with the first coolant circuit (11 and 12) and a thermostat (valve 14 are actuated by controller 10 based on the temperatures of sensors 18-20, Col. 4, Line 18) in fluid communication with the first coolant circuit (11 and 12) and the heat exchanger (3, Col. 3, Line 62, See Figure 6), wherein the thermostat (valve 14 are actuated by controller 10 based on the temperatures of sensors 18-20, Col. 4, Line 18) is configured to allow a flow of coolant to the heat exchanger (3) when a temperature of the first coolant circuit (11 and 12) exceeds a predetermined temperature (Col. 8, Lines 26-32 and Lines 1-5). Using broadest reasonable interpretation, a thermostat is defined as a device (10) that automatically responds to temperature changes (via sensors 18-20) and activates switch (14, Col. 4, Line 18) controlling the equipment. As to a predetermined temperature, Banzhaf et al. explicitly discloses that upon specific temperatures or temperatures differences valves are actuated (Col. 8, Lines 1-5) and further discloses that all valves are actuated upon measured temperature values (Col. 8, Lines 27-32). It is obvious that valve 14 is actuated in the same manner.

With regards to claim 9, the patent to Banzhaf et al. discloses a temperature sensor (19) in fluid communication with the first coolant circuit (11 and 12); a pump (13, Col. 4, Line 26) in fluid communication with the first coolant Circuits (11 and 12), and the pump (13, Col. 4, Lines 23-27) operable to cause a flow of coolant, and a fan (62

powered via motor 63, Col. 6, Lines 14-16, See Figure 7) proximally disposed relative to the heat exchanger (3, Col. 6, Lines 12-15, See Figure 7) and configured to blow air across the heat exchanger (3, Col. 6, Lines 12-15, See Figure 7); and a controller (10) in communication with the temperature sensor (19, Col. 4, Lines 20-25) and the pump (13) and the fan (62 powered via motor 63), wherein the controller (10) is configured to change the operation of the fan (62 powered via motor 63) and an operation of the pump (13) in response to a signal from the temperature sensor (19, Col. 8, Lines 26, 32).

With regards to claim 11, the patent to Banzhaf et al. discloses an oil cooler (90, Col. 7, Lines 26-28, via Lines 37 and 39) operatively connected to the engine (1, via transmission 2) and in communication with the first coolant circuit (11 and 12 via Lines 41 and 53). Banzhaf et al. does not positively disclose whether the torque converter (2) and circuits 41, 39, and 37 are in 'fluid' communication. However, Banzhaf et al. does disclose placing immediate heat exchangers on any part of the coolant circuit and functioning to cool and heat transmission oil (Col. 2, Lines 29-40). Furthermore, the publication to Ito et al. discloses an automatic transmission fluid warmer or ATF warmer (21, Paragraph 50, i.e. heat exchanger) integrated in an automatic transmission (22, Paragraph 50) using a fluid passage (22a) from engine (1, Paragraph 50). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit system of Banzhaf et al. with the transmission in view of the teaching to Ito et al., in order to warm up the transmission (Paragraph 50 from Ito et al.).

Therefore, establish fluid communication between the torque converter (2) and the first coolant circuit (11 and 12).

With regards to claim 13, the patent to Banzhaf et al. discloses an engine (1) having a first coolant circuit (11 and 12) and at least one auxiliary power unit (52) having a second coolant circuit (41), wherein the first coolant circuit (11 and 12) is in fluid communication with the second coolant circuit (41). As to the starter/generator connected to a first coolant circuit, Banzhaf et al. discloses a starter/generator (Col. 3, Lines 4-11) operatively connected to the engine and in fluid communication with a coolant circuit, but does not positively disclose the starter/generator connected to a first coolant circuit. Since Banzhaf et al. explicitly discloses auxiliary units being water-cooled generators (Col. 3, Lines 4-11), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuits of the Banzhaf et al. with a starter generator, in order to provide coolant to multiple auxiliary units (Col. 3, Lines 4-11).

As to the new limitation of “at least one **auxiliary power unit comprising a secondary engine** and having a second coolant circuit,” the patent to Worth discloses a second engine (See Figure 1).

Since Worth explicitly states on Col. 1, Lines 20-29 that "to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting" and on Col. 1, Lines 99-105 that “Thus, if we assume that engine 7 is running, the hot water going from the head of this engine will be conducted partly downward through the

radiator 5 and partly through the pipe 21 to the top of radiator 4", and Banzhaf et al. states on Col. 3, Lines 5-17 that "Moreover, **additional heating devices [i.e. heat from another engine] for auxiliary units**, ..., can be connected to the coolant circuit. It is likewise possible to provide coolant lines that can be shut off for the purpose of cooling auxiliary units, for example water-cooled generators. In order to control the air flow rate through the heat exchangers charged with cooling air, it is expedient to assign at least one speed-controlled fan to these heat exchangers. The drive of this fan can be performed, for example, by means of an electric motor, a liquid friction clutch or a hydrostatic drive," it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of the combination of Banzhaf et al. and Itoh et al. with at least one **auxiliary power unit comprising a secondary engine** and having a second coolant circuit in view of the teaching to Worth, in order to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting (Col. 1, Lines 20-29 from Worth)

With regards to claim 14, the patent to Banzhaf et al. discloses operating an auxiliary power unit (52) having a cooling circuit (41), pumping coolant through the auxiliary power unit cooling circuit (41) and directing the coolant from the auxiliary power unit cooling circuit to a cooling circuit of a main engine (1, via circuit 53 to circuits 11 and 12). Banzhaf et al. does not positively disclose directing a coolant from the main engine cooling circuit directly to the torque converter (i.e. fluid communication) and Banzhaf et al. does not positively disclose whether the torque converter (2) and circuits

41,39, and 37 are in 'fluid' communication. However, Banzhaf et al. does disclose placing immediate heat exchangers on any part of the coolant circuit and functioning to cool and heat transmission oil (Col. 2, Lines 29-40). Furthermore, the publication to Ito et al. discloses an automatic transmission fluid warmer or ATF warmer (21, Paragraph 50, i.e. heat exchanger) integrated in an automatic transmission (22, Paragraph 50) using a fluid passage (22a) from engine (1, Paragraph 50). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit system of Banzhaf et al. with the transmission in view of the teaching to Ito et al., in order to warm up the transmission (Paragraph 50 from Ito et al.). Therefore, establish fluid communication between the torque converter (2) and the first coolant circuit (11 and 12).

As to the new limitation of "at least one **auxiliary power unit to produce power for an electrical load, the auxiliary power unit** having a coolant circuit," the patent to Worth discloses a second engine (See Figure 1) for an electric locomotive (Col. 1, Lines 1-7).

Since Worth explicitly states on Col. 1, Lines 20-29 that "to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting" and on Col. 1, Lines 99-105 that "Thus, if we assume that engine 7 is running, the hot water going from the head of this engine will be conducted partly downward through the radiator 5 and partly through the pipe 21 to the top of radiator 4", and Banzhaf et al. states on Col. 3, Lines 5-17 that "Moreover, **additional heating devices [i.e. heat from another engine] for auxiliary units**, ..., can be connected to the coolant circuit. It is

likewise possible to provide coolant lines that can be shut off for the purpose of cooling auxiliary units, for example water-cooled generators. In order to control the air flow rate through the heat exchangers charged with cooling air, it is expedient to assign at least one speed-controlled fan to these heat exchangers. The drive of this fan can be performed, for example, by means of an electric motor, a liquid friction clutch or a hydrostatic drive," it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of the combination of Banzhaf et al. and Itoh et al. with at least one **auxiliary power unit to produce power for an electrical load, the auxiliary power unit** having a coolant circuit in view of the teaching to Worth, in order to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting (Col. 1, Lines 20-29 from Worth)

With regards to claim 15, the patent to Banzhaf et al. discloses allowing the coolant from the auxiliary power unit cooling circuit (41) to flow to the main engine cooling circuit (11,12) when the temperature of the coolant in the auxiliary power unit cooling circuit (41)is above a predetermined value (via valve 54 and controller 10). As to a predetermined temperature, Banzhaf et al. explicitly discloses that upon specific temperatures or temperatures differences valves (54) are actuated (Col. 8, Lines 1-5) and further discloses that all valves are actuated upon measured temperature values (Col. 8, Lines 27'32).

With regards to claim 16, the patent to Banzhaf et al. discloses directing (via valve 14, Col. 3, Lines 66-67) the coolant from the main engine cooling circuit (11,12) through a heat exchanger (3, Col. 3, Lines 66-67) when the temperature of the coolant in the main engine cooling circuit (11,12) is above a predetermined value (Col. 4, Lines 17-23). As to a predetermined value, Banzhaf et al. explicitly discloses that upon specific temperatures or temperatures differences valves are actuated (Col. 8, Lines 1-5) and further discloses that all valves are actuated upon measured temperature values (Col. 8, Lines 27-32). It is obvious that valve 14 is actuated the same way.

With regards to claim 17, the patent to Banzhaf et al. discloses sensing a temperature of the coolant in the main engine coolant circuit (via sensor 18-20); actuating a fan (62 via motor 63, Col. 8, Lines 26-32) to blow air across the heat exchanger (3, Col. 8, Lines 26-32); and actuating a pump (13, Col. 4, Lines 24-26) to cause the coolant in the main engine coolant circuit (11, 12) to flow; and the operation of the fan (62) and the operation of the pump (13) in response to a signal indicative of temperature of the coolant in the main engine coolant circuit (11, 12, Col. 8, Lines 26-32). 7.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) in view of Ito et al. (US Patent Publication 2002/0029755) and Worth (US Patent No. 1,974,907) as applied to claim 1 above, and further in view of Treadwell et al. (US Patent No. 1,632,636).

With regards to claim 12, the combination of Banzhaf et al. in combination with Ito et al. discloses all the limitations of the claimed subject, including Banzhaf et al. disclosure of a valve (91, Col. 7, Line 30, See Figure 6) operatively disposed between the torque converter (2) and the first coolant circuit (via circuit 53 and 41 to circuits 11 and 12). However, the combination does not positively disclose a check valve. Treadwell et al. discloses a check valve. Since Figure 6 discloses flow in one direction only indicated by the arrows and Banzhaf et al. already discloses the use of valves, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the coolant circuits of either Banzhaf et al. or Ito et al. with a check valve in view of the teaching to Treadwell et al., in order to permit flow in one direction (Col. 1, Lines 5-10 from Treadwell et al.) and prevent flow in an opposite direction.

Claims 3, 4, 5, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) in view of Ito et al. (US Patent Publication 2002/0029755) and Worth (US Patent No. 1,974,907) as applied to claims 1 and 14 above, and further in view of Sonnemann et al. (US Patent No. 5,794,575).

With regards to claim 3, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of wherein a third coolant circuit (11 ,.12, and 15) is in fluid communication with the first (11 and 12) and second

coolant circuit (41 via circuit 12 when valve 54 is opened), and Ito et al. disclosure of the first coolant circuit (5) connected to a second coolant circuits (22a) and a compartment heater (9, Paragraph 48) except a cabin having a third coolant circuit. Since the patent to Sonnemann et al. discloses a Cabin having a third coolant circuit (Col. 1, Lines 60-64) and multiple coolant branches in fluid communication with each other (See Figure 1, Col. 3, Lines 34-67 through Col. 4, Lines 1-40) and Banzhaf et al. discloses adding auxiliary units (Col. 3, Lines 4-11) and Ito et al. explicitly teaches a compartment heater (9, Paragraph 48), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit of Banzhaf et al. or Ito et al. with a cabin in view of the teaching to Sonnemann, in order to heat a passenger compartment (Col. 1, Lines 60-64).

With regards to claim 4, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of including a valve (14) in fluid communication with the first (11 and 12), second (41), and third coolant circuits (11,15, and 12), the valve (14) being movable between a first position where fluid from the first coolant circuits (11 and 12) flows through the third coolant circuit (11 and 15) and a second position where fluid is blocked from flowing through the third coolant circuit (11 and 15, See Figure 6). It is inherent that when valve 14 is open, the opening and closing of valve 14 will control flow to the third coolant circuit (11 and 15, See Figure 6).

With regards to claim 5, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of a heat exchanger (76, Col. 6, Lines 47-53) in fluid communication with the third coolant circuit (11, 12, and 15, when valve 14 is closed and valve 78 is opened, heat exchanger (76) is in fluid communication with circuits 11, 12, and 15, See Figure 6), except the heat exchanger configured to transfer heat from the third coolant circuit to blow air into a cabin. The patent to Sonnemann et al. discloses a heat exchanger (Col. 1, Lines 65-66) configured to transfer heat from the third coolant circuit to air blow into the cabin (Col. 3, Lines 60-65). Since the patent to Sonnemann et al. discloses a cabin having a third coolant circuit (Col. 1, Lines 60-64) and multiple coolant branches in fluid communication with each other (See Figure 1, Col. 3, Lines 34-67 through Col. 4, Lines 1-40) and as similar to Banzhaf et al. and Ito et al. explicit teaching of coolant branches interconnected with Banzhaf et al. explicit teaching of auxiliary devices and Ito et al. teaching of a compartment heater (9, Paragraph 48), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit of Banzhaf et al. or Ito et al. with a heat exchanger configured to transfer heat from the third coolant circuit to air blow into the cabin in view of the teaching to Sonnemann et al., in order to heat a passenger compartment (Col. 1, Lines 60-64 from Sonnemann et al.).

With regards to claim 18, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of directing coolant from the

auxiliary power unit (52) and main engine coolant circuits (11 and 12) to a third coolant circuit (11, 12, and 15, See Figure 6) and Ito et al. teaching of a compartment heater (9, Paragraph 48) except positively disclosing the third coolant circuit for heating a cabin. The patent to Sonnemann et al. discloses a cabin having a third coolant circuit (Col. 1, Lines 60-64). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the coolant circuit of Banzhaf et al. or Ito et al. with a cabin in view of the teaching to Sonnemann, in order to heat a passenger compartment (Col. 1, Lines 60-64).

Claims 20-24, 26, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) in view of Ito et al. (US Patent Publication 2002/0029755), and further in view of Sonnemann et al. (US Patent No. 5,794,575) and Worth (US Patent No. 1,974,907).

With regards to claim 20, the combination of Banzhaf et al. and Ito et al. discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of an engine having a first coolant circuit (11 and 12), a torque converter (2) operatively connected to the engine (1) and in communication with the first coolant circuit (41) and at least one auxiliary power unit (52) having a second coolant circuit (41) and Ito et al.'s disclosure of the first coolant circuit (5) is in fluid communication with the second coolant circuit (22a, See Explanation in Claim 1) and a compartment (9, Paragraph 48). However, the combination does not positively disclose a cabin, but does

disclose a vehicle (Col. 1, Line 7 from Banzhaf et al.) and a transmission (2 from Banzhaf et al., 22, Paragraph 50 from Ito et al.). Sonnemann et al. also discloses a 'modern' motor vehicle in particular passenger cars (Col. 1, Lines 19-20) and the qualifier for 'modern' is 1998 and further discloses a passenger compartment (Col. 1, Lines 60-64). As to the limitation of "an engine disposed outside the cabin and configured to drive machine (i.e. vehicle),", it would have been further obvious to a person of ordinary skill in the art at the time the invention was made to provide the coolant circuit of Banzhaf et al. or Ito et al. with an engine disposed outside the cabin and configured to drive machine in view of the teaching to Sonnemann, in order to heat a passenger compartment or cabin (Col. 1, Lines 60- 64).

As to the new limitation of "at least one **auxiliary power unit comprising a secondary engine** and having a second coolant circuit," the patent to Worth discloses a second engine (See Figure 1).

Since Worth explicitly states on Col. 1, Lines 20-29 that "to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting" and on Col. 1, Lines 99-105 that "Thus, if we assume that engine 7 is running, the hot water going from the head of this engine will be conducted partly downward through the radiator 5 and partly through the pipe 21 to the top of radiator 4", and Banzhaf et al. states on Col. 3, Lines 5-17 that "Moreover, **additional heating devices [i.e. heat from another engine] for auxiliary units, ...**, can be connected to the coolant circuit. It is likewise possible to provide coolant lines that can be shut off for the purpose of cooling auxiliary units, for example water-cooled generators. In order to control the air flow rate

through the heat exchangers charged with cooling air, it is expedient to assign at least one speed-controlled fan to these heat exchangers. The drive of this fan can be performed, for example, by means of an electric motor, a liquid friction clutch or a hydrostatic drive," it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the cooling system of the combination of Banzhaf et al., Sonnemann, and Itoh et al. with at least one **auxiliary power unit comprising a secondary engine** and having a second coolant circuit in view of the teaching to Worth, in order to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting (Col. 1, Lines 20-29 from Worth)

With regards to .claim 21, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of including a starter/generator operatively connected to the engine and in fluid communication with a coolant circuit (Col. 3, Lines 4-11) but does not explicitly disclose the starter generator with the first coolant circuit as claimed above. Since Banzhaf et al. explicitly discloses auxiliary units being water-cooled generators and being connected to any coolant circuit, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the first coolant circuit of the Banzhaf et al. or Ito et al. with a starter generator in view of the Banzhaf et al. teaching to the water-cooled generators, in order to provide coolant to multiple auxiliary units (Col. 3, Lines 4-11).

With regards to claim 22, the combination discloses all the limitations of the claimed Subject matter, including Banzhaf et al. disclosure of wherein a third coolant circuit (11, 12, and 15) is in fluid communication with the first (11 and 12) and second coolant circuit (41 via circuit 12 when valve 54 is opened), and Ito et al. disclosure of the first coolant circuit (5) connected to a second coolant circuits (22a) and a compartment heater (9, Paragraph 48) except a cabin having a third coolant circuit. Since the patent to Sonnemann et al. discloses a cabin having a third coolant circuit (Col. 1, Lines 60-64)and multiple coolant branches in fluid communication with each other (See Figure 1, Col. 3, Lines 34-67 through Col. 4, Lines 1-40) and Banzhaf et al. discloses adding auxiliary units (Col. 3, Lines 4-11) and Ito et al. explicitly teaches a compartment heater (9, Paragraph 48), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit of Banzhaf et al. or Ito et al. with a cabin in view of the teaching to Sonnemann, in order to heat a passenger compartment (Col. 1, Lines 60-64).

With regards to claim 23, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of including a valve (14) in fluid communication with the first (11 and 12), second (41), and third coolant circuits (11,15, and 12), the valve (14) being movable between a first position where fluid from the first coolant circuits (11 and 12) flows through the third coolant circuit (11 and 15) and a second position where fluid is blocked from flowing through the third coolant circuit (11 and 15, See Figure 6). It is inherent that when valve 14 is open, the opening

and closing of valve 14 will control flow to the third coolant circuit (11 and 15, See Figure 6).

With regards to claim 24, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of a heat exchanger (76, Col. 6, Lines 47-53) in fluid communication with the third coolant circuit (11, 12, and 15, when valve 14 is closed and valve 78 is opened, heat exchanger (76) is in fluid communication with circuits 11, 12, and 15, See Figure 6), except the heat exchanger configured to transfer heat from the third coolant circuit to blow air into a cabin. The patent to Sonnemann et al. discloses a heat exchanger (Col. 1, Lines 65-66) configured to transfer heat from the third coolant circuit to air blow into the cabin (Col. 3; Lines 60-65). Since the patent to Sonnemann et al. discloses a cabin having a third coolant circuit (Col. 1, Lines 60-64) and multiple coolant branches in fluid communication with each other (See Figure 1, Col. 3, Lines 34-67 through Col. 4, Lines 1-40) and as similar to Banzhaf et al. and Ito et al. explicit teaching of coolant branches interconnected with Banzhaf et al. explicit teaching of auxiliary devices and Ito et al. teaching of a compartment heater (9, Paragraph 48), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the coolant circuit of Banzhaf et al. or Ito et al. with a heat exchanger configured to transfer heat from the third coolant circuit to air blow into the cabin in view of the teaching to Sonnemann et al., in order to heat a passenger compartment (Col. 1, Lines 60-64 from Sonnemann et al.).

With regards to claim 26, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of a thermostat (valve 54 are actuated by controller 10 based on the temperatures of sensors 94-97, Col. 7, Lines 55-65) in fluid communication with the second coolant circuit (41, See Figure 6) and wherein the thermostat (valve 54 are actuated by controller 10 based on the temperatures of sensors 94-97, Col. 7, Lines 55-65) is configured to allow a flow of coolant from the second coolant circuit (41) to the first coolant circuit (11 and 12, Col. 5, Lines 45-50) when a temperature of the second coolant circuit (41) is above a predetermined value. Using broadest reasonable interpretation, a thermostat is defined as a device (10) that automatically responds to temperature changes (via sensors 94-97) and activates switches (54) controlling the equipment. As to a predetermined temperature, Banzhaf et al. explicitly discloses that upon specific temperatures or temperatures differences valves (54) are actuated (Col. 8, .Lines 1-5) and further discloses that all valves are actuated upon measured temperature values (Col. 8, Lines 27-32).

With regards to claim 27, the patent to Banzhaf et al. discloses a heat exchanger (3) in fluid communication with the first coolant circuit (11 and 12) and a thermostat (valve 14 are actuated by controller 10 based on the temperatures of sensors 18-20, Col. 4, Line 18) in fluid communication with the first coolant circuit (11 and 12) and the heat exchanger (3), wherein the thermostat (valve 14 are actuated by controller 10

based on the temperatures of sensors 18-20, Col. 4, Line 18) is configured to allow a flow of coolant to the heat exchanger (3) when a temperature of the first coolant circuit (11 and 12) exceeds a predetermined temperature. Using broadest reasonable interpretation, a thermostat is defined as a device (10) that automatically responds to temperature changes (via sensors 18-20) and activates switches (valve 14) controlling the equipment. As to a predetermined temperature, Banzhaf et al. explicitly discloses that upon specific temperatures or temperatures differences valves (54) are actuated (Col. 8, Lines 1-5) and further discloses that all valves are actuated upon measured temperature values (Col. 8, Lines 27-32). It is obvious that valve 14 works the same way.

With regards to claim 28, the patent to Banzhaf et al. discloses a temperature sensor (19) in fluid communication with the first coolant circuit (11 and 12); a pump (13) in fluid communication with the first coolant circuits (11 and 12), and the pump (13, Col. 5, Lines 40-42) operable to cause a flow of coolant, and a fan (62 powered via motor 63, Col. 6, Lines 10-16, See Figure 7) proximally disposed relative to the heat exchanger (3) and configured to blow air across the heat exchanger (3); and a controller (10, Col. 8, Lines 25-32) in communication with the temperature sensor (19) and the pump (13) and the fan (62 powered via motor 63), wherein the controller (10) is configured to change the operation of the fan (62 powered via motor 63) and an operation of the pump (13) in response to a signal from the temperature sensor (19, Col. 8, Lines 25-32).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) and Ito et al. (US Patent Publication 2002/0029755) in combination with Sonnemann et al. (US Patent No. 5,794,575) and Worth (US Patent No. 1,974,907) as applied to claim 3, and further in view of Treadwell et al. (US Patent No. 1,632,636).

With regards to claim 10, the combination discloses all the limitations of the claimed subject matter, including Banzhaf et al.'s disclosure of further including a valve (14) in fluid communication with the third coolant circuit (15, 11, 12, and connecting line with heat exchanger 76 when valve 78 is opened) and the first coolant circuit (11 and 12) and the second coolant circuit (41, via Line 53, See Figure 6), but the combination does not positively disclose a check valve. Treadwell et al. discloses a check valve. Since Banzhaf et al. discloses flow in only one direction in each circuit (See arrows in Figure 6) and uses valves to control flow to different circuits, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further provide the coolant circuit of Banzhaf et al. and Ito et al. in combination with Sonnemann et al. with a check valve in view of the teaching to Treadwell et al., in order to permit flow in one direction (Col. 1, Lines 5-10) and prevent flow in an opposite direction.

Claims 6, 19, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Banzhaf et al. (US Patent No. 5,215,044) and Ito et al. (US Patent Publication 2002/0029755) in combination with Sonnemann et al. (US Patent No. 5,794,575) and Worth (US Patent No. 1,974,907) as applied to claims 4, 18, and 23 respectively, and further in view of Chamot et al. (US Patent No. 5,427,062).

With regards to claim 6, the combination of Banzhaf et al., Ito et al., Worth, and Sonnemann et al. discloses all the limitations of the claimed subject matter, including Banzhaf et al. disclosure of a controller (10, Col. 8, Lines 25-32) in communication with the at least one valve (14) and the at least one temperature sensor (19) and wherein the controller (10) is configured to move the at least one valve (14) between the first position and the second position in response to a signal from the at least one temperature sensor (19) and Sonnemann et al. disclosure of a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), except positively disclosing a temperature sensor disposed in the cabin. The patent to Chamot et al. discloses a temperature sensor (13e) disposed in the cabin (2). Since Banzhaf et al. already discloses a controller (10, Col. 81 Lines 25-32) that uses temperatures sensors (18-20) as a parameter and Sonnemann et al. discloses a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the passenger compartment of Sonnemann et al. with a temperature sensor in view of the teaching to Chamot et al., in order to find the value of the parameter, i.e. the temperature of the passenger compartment (Col. 4, Lines 29-31).

With regards to claim 19, the combination of Banzhaf et al., Ito et al., Worth, and Sonnemann et al. discloses all the limitations of the claimed subject matter, including Banzhaf et al.'s disclosure of moving at least one valve (14), in response to the temperature (via controller 10, Col. 8, Lines 26-32), between a first position where coolant is allowed to flow through the third circuit (11, 12, and 15) and a second position where coolant is blocked from flowing through the third circuit (11, 12, and 15) in response to the temperature (via controller 10, Col. 8, Lines 26-32) and Sonnemann et al. disclosure of a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), except sensing a temperature of the cabin. The patent to Chamot et al. discloses a temperature sensor (13e) disposed in the cabin (2). Since Banzhaf et al. already discloses a controller (10, Col. 8, Lines 25-32) that uses temperatures Sensors (18-20) as a parameter and Sonnemann et al. discloses a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the passenger compartment of Sonnemann et al. with a temperature sensor in view of the teaching to Chamot et al., in order to find the value of the parameter, i.e. the temperature of the passenger compartment (Col. 4, Lines 29-31 from Chamot et al.).

With regards to claim 25, the combination of Banzhaf et al., Ito et al., Worth, and Sonnemann et al. discloses all the limitations of the claimed subject matter, including Banzhaf et al.'s disclosure of a controller (10) in communication with the at least one

valve (14) and the at least one temperature sensor (19), wherein the controller (10) is configured to move the at least one valve between the first position and the second position in response to a signal from the at least one temperature sensor (19) and Sonnemann et al. disclosure of a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), except a temperature sensor disposed in the cabin. The patent to Chamot et al. discloses a temperature sensor (13e) disposed in the cabin (2). Since Banzhaf et al. already discloses a controller (10, Col. 8, Lines 25-32) that uses temperatures sensors (18-20) as a parameter and Sonnemann et al. discloses a cabin (i.e. passenger compartment, Col. 3, Lines 60-67), it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the passenger compartment of Sonnemann et al. with a temperature sensor in view of the teaching to Chamot et al., in order to find the value of the parameter, i.e. the temperature of the passenger compartment (Col. 4, Lines 29-31 from Chamot et al.).

Response to Arguments

Applicant's arguments with respect to claims 1, 13, 14, and 20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's Arguments

Applicant amended the claims to include the limitation of a second auxiliary power unit capable of producing power and further includes the limitation of having a second engine.

Examiner's Response to Arguments

Applicant has claimed very broad structures and has further clarified the claimed subject matter.

The patent to Worth (US Patent No. 1,974,907) clearly shows a second engine (or auxiliary power unit) within an engine cooling system. Since Worth explicitly states on Col. 1, Lines 20-29 that "to prevent freezing and also maintain the idle engine at a temperature which will permit easy starting" and Banzhaf et al. explicitly states on Col. 2 Lines 13-22 that "It is known that the temperature profile inside an engine varies considerably, because the temperature peak occurs in the cylinder head whereas the engine block is exposed to a substantially lower temperature. It is therefore proposed that a separate coolant inlet and coolant outlet are provided for the engine block and the cylinder head, in each case, and at least one of these coolant connections can be restricted or cut off by means of a valve," both patents are concerned in solving heating and cooling inefficiencies.

In addition, Banzhaf et al. clearly provides motivation of adding auxiliary units on Col. 3, Lines 5-17 that "Moreover, additional heating devices [i.e. heat from another engine] for auxiliary units, for example heaters for the cleaning water of a screen washing system, can be connected to the coolant circuit. It is likewise possible to provide coolant lines that can be shut off for the purpose of cooling auxiliary units, for

example water-cooled generators. In order to control the air flow rate through the heat exchangers charged with cooling air, it is expedient to assign at least one speed-controlled fan to these heat exchangers. The drive of this fan can be performed, for example, by means of an electric motor, a liquid friction clutch or a hydrostatic drive."

Furthermore, Worth further explains the cooling relationship of the two engines on Col. 1, Lines 99-105 "Thus, if we assume that engine 7 is running, the hot water going from the head of this engine will be conducted partly downward through the radiator 5 and partly through the pipe 21 to the top of radiator 4"

Thus, this action is made final.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH COLEMAN whose telephone number is (571)270-3516. The examiner can normally be reached on 5:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571)272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAC
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Examiner, Art Unit 3747

/Stephen K. Cronin/
Supervisory Patent Examiner, Art Unit 3747